

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

06 JUN 2005

PCT/EP2003/010550



Applicant's or agent's file reference L 1 P 18 WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/010550	International filing date (day/month/year) 23 September 2003 (23.09.2003)	Priority date (day/month/year) 07 December 2002 (07.12.2002)
International Patent Classification (IPC) or national classification and IPC C11C 3/00		
Applicant LURGI AG		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet. <input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of <u>1</u> sheets.
3. This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 06 May 2004 (06.05.2004)	Date of completion of this report 15 April 2005 (15.04.2005)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/010550

I. Basis of the report

1. With regard to the elements of the international application:*

☒ the international application as originally filed☒ the description:

pages _____ 1-5 _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☒ the claims:

pages _____, as originally filed

pages _____, as amended (together with any statement under Article 19

pages _____, filed with the demand

pages _____ 1-3 _____, filed with the letter of _____ 21 October 2004 (21.10.2004)

☒ the drawings:

pages _____ 1 _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.4. ☐ The amendments have resulted in the cancellation of:☐ the description, pages _____☐ the claims, Nos. _____☐ the drawings, sheets/fig _____5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP 03/10550

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.	Statement			
	Novelty (N)	Claims	1-3	YES
		Claims		NO
	Inventive step (IS)	Claims		YES
		Claims	1-3	NO
	Industrial applicability (IA)	Claims	1-3	YES
		Claims		NO

2. Citations and explanations

Reference is made to the following document:

D1: EP-A-0 249 463 (BIO ENERGY TECHNOLOGY LTD)

16 December 1987 (1987-12-16)

1. Novelty and inventive step of independent claim 1

1.1 D1 is considered to be the prior art closest to the subject matter of claim 1. Said document discloses (see claim 1; figure 1; column 2, last paragraph; column 4, paragraphs 2-6; and example 1) a method for the intensive aftertreatment of biodiesel with the following steps: crude methyl ester is formed by transesterification of a vegetable fat or animal fat with methanol, the crude methyl ester thus formed undergoes intensive aftertreatment with a strong acid at room temperature (the mixture may also be heated to at least about 60°C), the ester layer separated from the emulsion thus formed is thoroughly washed with water and then dried.

1.2 The subject matter of claim 1 therefore differs from the known method in that a fine emulsion is produced from the ester phase and from the acid phase in a mechanical intensive mixer.

1.3 The applicant's arguments in the letter dated 21 October 2004 have been considered. They underline the difference between the D1 process and the process in the application. However, no technical effect arising from this difference is disclosed.

1.4 The subject matter of the claim does not therefore involve an inventive step (PCT Article 33(3)).

2. Dependent claims

2.1 D1 discloses the subject matter of dependent claims 2-3, which cannot therefore be regarded as inventive (PCT Article 33(3))

(see the following specific references for the claims indicated):

- example 1 of D1 for the present claim 2
- column 4, third paragraph, of D1 for the present claim 3.

REPLICATED
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CLAIMS

1. A method for improvement of the long term stability of biodiesel, characterized in that the crude methyl ester produced by transesterification of a vegetable or animal fat or oil with methanol, is treated intensively with a strong acid or with a mixture of a strong acid and a complex former and the ester layer separated from the emulsion formed thereby is subjected to a thorough water washing and subsequently dried.
2. The method according to Claim 1, characterized in that the after-treatment of biodiesel with a strong acid or with a mixture of a strong acid and a complex former is carried out at a temperature between 25 and 60 °C.
3. The method according to Claims 1 and 2, characterized in that the treatment of biodiesel is carried out in a mechanically intensive mixer.
4. The method according to Claims 1 through 3, characterized in that as strong acid hydrochloric acid, sulfuric acid, p-toluenesulfonic acid or phosphoric acid are employed and as complex former EDTA or citric acid.
5. The method according to Claims 1 through 4, characterized in that the water wash of biodiesel is carried out in a wash column according to the counter current principle or by means of a mechanically intensive mixer.

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5 Neue Patentansprüche

JC20 Rec'd PCT/PTO 06 JUN 2005

- 10 1. Verfahren zur Verbesserung der Langzeitstabilität von Biodiesel, wobei
- 1.1 durch Umesterung eines pflanzlichen oder tierischen Fettes oder
Öles mit Methanol Rohmethylester gebildet wird,
- 15 1.2 der so gebildete Rohmethylester mit einer starken Säure oder mit
einer Mischung aus einer starken Säure und einem Komplexbild-
ner bei Temperaturen zwischen 25 und 60°C intensiv nachbehandelt wird,
- 20 **dadurch gekennzeichnet, dass**
- 1.3 in einem mechanischen Intensiv-Vermischer aus der Ester- und
aus der Säurephase eine Feinemulsion hergestellt wird,
- 25 1.4 die aus der dabei gebildeten Emulsion abgetrennte Esterschicht
einer gründlichen Wasserwäsche unterworfen und anschließend
getrocknet wird.
- 30 2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet**, dass als starke
Säure Salzsäure, Schwefelsäure, p-Toluolsulfonsäure oder Phosphorsäure und
als Komplexbildner EDTA oder Zitronensäure eingesetzt werden.
- 35 3. Verfahren nach den Ansprüchen 1 bis 2, **dadurch gekennzeichnet**,
dass die Wasserwäsche des Biodiesels in einer Waschkolonne nach dem Ge-
genstromprinzip oder mittels eines mechanischen Intensiv-Vermischers erfolgt.

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Original Version of the
Patent Application